

Issue DS 2018-076: The petitioner Lorenzo Corbiella is seeking a declaratory statement on whether Section 1607.8.1 is the applicable section for the design of glass handrail and guards assemblies in an interior installation. Specifically, the Petitioner provides for the following questions:

Is Section 1607.8.1 the applicable Section of the Florida Building Code for the design of glass handrail and guards assembly in an interior installation?

Since the project address resides within a High Velocity Hurricane Zone as defined by the Florida Building Code, is Chapter 16, Section 1618.4.6.3, High Velocity Hurricane Zones Special Load Considerations, the applicable section of the Florida Building Code for the design of a glass handrail and guards in an interior installation?

Background:

Lineaire is the architect for the future renovation of retail space 107 at 350 NE 24th Street, Miami, FL 33137. A mixed-use, 14 story building with retail use on the ground level and residential use on the upper stories location in the City of Miami, FL. As part of the renovation of this retail space, the existing steel guards, handrails, and pickets of an open, internal stairway to this mezzanine space are being replaced with a new 9/16" laminated and tempered glass handrail and guard assembly designed to comply with linear and concentrated loads of section 1607.8.1 and section 2407 of the Florida Building Code.

6th Edition (2017) Florida Building Code, Building Chapter 16

1601.1 Scope. The provisions of this chapter shall govern the structural design of buildings, structures and portions thereof regulated by this code.

Exception: Buildings and structures located within the high-velocity hurricane zone shall comply with the provisions of Sections 1605, 1607, 1611, 1616 through 1626, and, as applicable in flood hazard areas, Section 1612.

1607.8.1 Handrails and guards.

Handrails and *guards* shall be designed to resist a linear load of 50 pounds per linear foot (plf) (0.73 kN/m) in accordance with Section 4.5.1 of ASCE 7. Glass handrail assemblies and *guards* shall also comply with Section 2407.

Exceptions:

1. For one- and two-family dwellings, only the single concentrated load required by Section 1607.8.1.1 shall be applied.
2. In Group I-3, F, H and S occupancies, for areas that are not accessible to the general public and that have an *occupant load* less than 50, the minimum load shall be 20 pounds per foot (0.29 kN/m).

1607.8.1.1 Concentrated load.

Handrails and guards shall be designed to resist a concentrated load of 200 pounds (0.89 kN) in accordance with Section 4.5.1 of ASCE 7.

1607.8.1.2 Intermediate rails.

Intermediate rails (all those except the handrail), balusters and panel fillers shall be designed to resist a concentrated load of 50 pounds (0.22 kN) in accordance with Section 4.5.1 of ASCE 7.

1618.4.6.3

Laminated glazing will be permitted as an **equal alternate to pickets**, if tested by an accredited laboratory to satisfy the resistance requirements of this code for wind, live and kinetic energy impact loading conditions. The kinetic energy impact loading shall comply with ANSI Z97.1 using a 400 foot-pound (542 N) energy impact. The safety requirements of the impact test shall be judged to have been satisfactorily met if breakage does not occur or numerous cracks and fissures occur but no shear or opening through which a 3-inch (76 mm) diameter sphere may freely pass. The glass panel shall remain within the supporting frame.

1618.4.6.4

If the posts that support the top rail of exterior railings are substituted with glass, the assembly shall be tested to TAS 201, where the impacted glass continues to support the top rail and all applicable loads after impact.

6th Edition (2017) Florida Building Code, Building Chapter 24

2401.1 Scope. The provisions of this chapter shall govern the materials, design, construction and quality of glass, light transmitting ceramic and light-transmitting plastic panels for exterior and interior use in both vertical and sloped applications in buildings and structures.

Exception: Buildings and structures located within the high-velocity hurricane zone shall also comply with the provisions of Sections 2410 through 2415, excluding Section 2405.5.

SECTION 2407 GLASS IN HANDRAILS AND GUARDS

2407.1 Materials.

Glass used in a handrail, guardrail or a *guard* section shall be laminated glass constructed of fully tempered or heat-strengthened glass and shall comply with Category II or CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1. Glazing in railing in-fill panels shall be of an *approved* safety glazing material that conforms to the provisions of Section 2406.1.1. For all glazing types, the minimum nominal thickness shall be $\frac{1}{4}$ inch (6.4 mm).

Exception: Single fully tempered glass complying with Category II of CPSC 16 CFR Part 1201 or Class A of ANSI Z97.1 shall be permitted to be used in handrails and guardrails where there is no walking surface beneath them or the walking surface is permanently protected from the risk of falling glass.

2407.1.1 Loads.

The panels and their support system shall be designed to withstand the loads specified in Section 1607.8. A design factor of four shall be used for safety.

2407.1.2 Support.

Each handrail or *guard* section shall be supported by a minimum of three glass balusters or shall be otherwise supported to remain in place should one baluster panel fail. Glass balusters shall not be installed without an attached handrail or *guard*.

Exception: A top rail shall not be required where the glass balusters are laminated glass with two or more glass plies of equal thickness and the same glass type when *approved* by the *building official*. The panels shall be designed to withstand the loads specified in Section 1607.8.

553.73 Florida Building Code.—Florida Statutes (2016)

(7)(g) Amendments or modifications to the foundation code pursuant to this subsection shall remain effective only until the effective date of a new edition of the Florida Building Code every third year. Amendments or modifications related to state agency regulations which are adopted and integrated into an edition of the Florida Building Code shall be carried forward into the next edition of the code, subject to modification as provided in this part. **Amendments or modifications related to the wind-resistance design of buildings and structures within the high-velocity hurricane zone of Miami-Dade and Broward Counties which are adopted to an edition of the Florida Building Code do not expire and shall** be carried forward into the next edition of the code, subject to review or modification as provided in this part. If amendments that expire pursuant to this paragraph are resubmitted through the Florida Building Commission code adoption process, the amendments must specifically address whether:

Staff Analysis:

Questions:

- (1) Is Section 1607.8.1 the applicable Section of the Florida Building Code for the design of glass handrail and guards assembly in an interior installation?

Answer:

Option #1/Petitioner: Petitioner respectfully believes that the engineering of handrails and guards for an interior application not subject to High Velocity Hurricane forces of the physical location of the project is governed by Sections 1607.8.1 and 2407 and that the use of the phrase “handrails and Guards shall be designed...” is an affirmative statement that an engineered system, complying with the requirements of the Florida Building Code, Section 1607.8.1 and 2407 is acceptable.

Option #2/Staff: Yes. However, in addition to meeting the design requirements of section 1607.8.1 of the 6th Edition (2017) FBC, Building, the interior glazed handrail/guards in question must also meet the applicable requirements of Chapter 24 of the 6th Edition (2017) FBC, Building.

- (2) Since the project address resides within a High Velocity Hurricane Zone as defined by the Florida Building Code, **is Chapter 16, Section 1618.4.6.3, High Velocity Hurricane Zones Special Load Considerations, the applicable section of the Florida Building Code for the design of a glass handrail and guards in an interior installation?**

Answer: No. The requirement of Section 1618.4.6.3 of the 6th (2017) FBC, Building is a wind-resistant requirement which does not apply to the interior glazed handrail/guards in question.